

DISCLAIMER: These Standard Operating Procedures (SOP's) are for the exclusive use of Navy Public Works Center (PWC) Norfolk. They are promulgated as guidance for their NAVFAC Commands. If intended to be used by other activities, they must be tailored to each activity's particular requirements and must be reviewed/approved by the activity's safety professionals prior to use.

**NAVY PUBLIC WORKS CENTER
NORFOLK, VIRGINIA
UTILITIES DEPARTMENT**

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

**TITLE
PM PRIMARY FUSED AIR SWITCH**

**PROCEDURE NUMBER
WC 624 HVE 071**

SIGNED:_____
(DATE)

APPROVED:_____
(DATE)

SAFETY PROFESSIONAL:_____
(DATE)

MANAGEMENT OFFICIAL:_____
(DATE)

REVISION

A

PM PRIMARY FUSED AIR SWITCH

DISTRIBUTION

CODE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE
601.C3							
620							
622							
610.E1							
622.3							

PM PRIMARY FUSED AIR SWITCH

REVISIONS

REV	DESCRIPTION	SIGNATURE	DATE
A	Initial Issue.		

PM PRIMARY FUSED AIR SWITCH

Purpose:

Procedure to perform preventative maintenance on a three phase, 34.4/11.5/4.16 kv, fused air switch.

Potential Energy Sources:

1. 34.5/11.5/4.16 kv cables and equipment.
2. Generators if installed at facilities to provide temporary power during the transformer change out.

Tools and PPE:

Tools: Hand tools, high voltage tester, Meggar, Micro-Ohm meter. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, work gloves, safety glasses, safety goggles, and back brace if required by back injury prevention and control program. The class of rubber gloves and sleeves will depend on the exposure voltage as per the following: Class 0 - up to 1,000 volts, Class 1 - up to 7,500 volts, Class 2 - up to 17,000 volts, Class 3 - up to 26,500 volts, Class 4 - up to 36,000 volts.

References:

1. PWC Occupational Safety and Health Program Manual, PWCNORVAINST 5100.33E
2. Occupational Safety and Health Standards for General Industry (29 CFR PART 1910): Subpart I, Personnel Protective Equipment; Subpart R, Electrical Power Generation / Transmission / Distribution; Subpart S, Electrical
3. NFPA 70 E approach distances to exposed, energized, electrical conductors and circuit parts.
4. SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
5. SOP WC 622 HVE 007, Switchout And Switchback Energized Circuit
6. SOP WC 624 HVE 062, Clean, Repair, Replace Insulating Barrier Boards.

Procedures:

1. WC 622 personnel will deenergize the primary circuit per SOPs
 - a) WC 622 HVE 007, Switchout and Switchback Energized Circuit
 - b) WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

WC 622 personnel will ensure that the facility's emergency generator or temporary power generator, if present, is isolated and will not back feed to the transformer.

2. Using a high voltage tester test the primary circuit's cables to verify they are deenergized. Before the conductors are checked, test the high voltage tester on a known energized circuit to verify the tester is working. Test each deenergized conductor separately, taking care not to cross phase during test. If voltage is detected, stop the test and (a) notify WC 622 personnel that the circuit is still energized, (b) wait for WC 622 personnel to correct the problem, (c) perform the deenergization verification test once again after WC 622 personnel finish switching operations and declare the cables deenergized. If no voltage is indicated, retest the high voltage tester to re-verify it is working properly. Wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat while testing.

PM PRIMARY FUSED AIR SWITCH

3. The required PPE for the PM work includes work gloves, safety shoes, and safety glasses. When using solvent wear safety goggles instead of safety glasses. Refer to the JHA for details.
 4. Remove access covers from the switch.
 5. Inspect and clean the cable terminators and all switch insulators. Look for chipping, cracking, or tracking. Repair or replace damaged units. Order new parts if necessary.
 6. Vacuum dirt from switch floor.
 7. Inspect, clean, and/or repair the insulating barrier boards per SOP WC 624 HVE 062, Clean, Repair, Replace Insulating Barrier Boards.
 8. Remove the fuses. Clean the contact area of the fuses and fuse holders. Clean the insulating surfaces of the fuses and fuse holders.
 9. Inspect, clean, and dress the contacts, main and arcing. If a contact requires replacement, note the switch manufacture, switch type, switch serial number, and part number(if available) so the contact can be ordered.
 10. Clean and lubricate the switch's operating mechanism. Tighten all loose bolts. Check the operation of the switch and make all necessary adjustments to ensure the switch is operating properly.
 11. Perform insulating resistance tests: phase to phase, and each phase to ground. Refer to attached table.
 12. Perform contact resistance test across each switch blade and fuse holder.
- Note - The tester will wear insulating rubber gloves, hard hat, safety shoes, safety glasses, and Nomex coveralls while performing electrical tests. Personnel will stay clear of switch while testing is in progress.
13. Reattach all access panels.
 14. WC 622 personnel will energize the primary circuit and transformer per SOPs
 - a) WC 622 HVE 007, Switchout and Switchback Energized Circuit
 - b) WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

END